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A SIXTH LETTER
TO SIR JOSEPH BANKS Baronet
President of the Royal Society,

ON THE

Subject of Cochineal Insects, discovered at Madras,

By *JAMES ANDERSON* M. D.

With a Copper Plate Engraving Annexed, of the different INSECTS,
mentioned in the Letters, from the Drawings of BARON REICHEL.

Also an Engraving of the *Opuntia Major Spinulis obtusis mollibus, & innocentibus*, and the Plan of a Nopalry in the Bishoprick of Guaxaca in the Kingdom of Mexico, Extracted from the Second Volume of SIR HANS SLOANE'S HISTORY OF JAMAICA, for the use of Country Gentlemen who may be disposed to make Plantations, and are not in possession of that Work.

MILEZIA MAGNO
VELLERA MUTENTUR, TYRIOS INCCCTA RUBORES.
VIRG. GEOR. LIB. 3.

MADRAS: Printed by CHARLES FORD.

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MDCCLXXXVII.

A B I X T I E T
To the Honorable

President of the Senate

U. S. Capitol Building

Washington, D. C.

Dear Sir:

I have the honor to acknowledge the receipt of your letter of the 10th inst. in relation to the proposed amendment to the Constitution of the United States, and in reply to inform you that the same has been forwarded to the proper authorities for their consideration.



I am, Sir, very respectfully,
Your obedient servant,

Wm. A. R. [Signature]

ATTEST:

Wm. A. R. [Signature]

Secretary of the Senate

To Sir Joseph Banks Baronet
President of the Royal Society.

DEAR SIR,

BESIDES the three Cochneal Insects mentioned in my former Letters, I have found three others, one of which nearly resembles the *Phyllanthus Emblica* Insect, excepting that it is smaller in size, on the *Vitis Vinifera* and *Cooloo Valley* of the *Tamuls* which Doctor Ruffel tells me is the *Galega Prostrata* of Koning.

Another on the *Jumbo* of the *Tamuls*, or *Robinia Mitis* of *Linnaeus*.

This Insect is found on the bark of the Tree, under a matted silky substance, which is so remarkably white, it is conspicuous at the distance of twenty yards.

When the silky substance is removed, a beautiful cluster of motionless particles shining and glossy, like the eggs of Insects appears, but magnifying glasses discover them to be furnished with all the limbs complete.

As they acquire power they creep away, and those who are farther advanced and grown to a greater size, lose their scarlet colour and become diaphanous.

I can perceive no Caterpillars amongst them; but have found one male fly, creeping sluggishly over the females, which is nearly the same with that of the *Guava* Insect already described, having only two procumbent wings twice as long as the *Abdomen*, and two long hairs like threads of white enamel at the extremity of the *Abdomen*.

The body of the female is flat like the *Cimex Domesticus*, and when full grown is of a dark-green colour.

A third Insect I have found on the *Brinjaul*, *Cattri-Cay*, or *Vaidelungai*, of the *Tamuls*, which is a culinary plant here or *Solanum Nicotiana* of *Linnaeus*.

The third Insect, except the *antennæ* and *apex* of the *punctum subulatum* which are of a chocolate colour, is of a *diaphanous* white throughout,—It is viviparous, and the young, which are perfectly white, and not bigger than the mites in cheese, ramble about incessantly, till they have spun a cylindrical case of silk in which they remain without the possibility of removing.

removing, as the silky case in which they then lye, adheres firmly to the plant.

Both the male and the caterpillar of this, nearly resembles those of the Guava Insect.

The very great difficulty there is in getting accurate engravings made in this country, prevents me at present from going farther into their description, being satisfied likewise, enough has been done to demonstrate the existence of Cochineal Insects here, and excite a spirit of enquiry in others qualified to carry the research beyond what my situation will admit of.

By the assistance of many gentlemen here, there will soon be plantations made on many parts of the coast.

At Ongole about 170 miles north of this place Mr. Young is making a plantation, but I am obliged to send the *Opuntias* from hence as they are not natives north of the Pennar.

I have likewise sent plants to Mr. Lenox at Madepollam in the Lat. of $16^{\circ}26'$ and to Mr. Roxburgh at Samal-Cottah situated in the Lat. of Antequera, as well as to Doctor Ruffell at Vizagapatam in the parallel of $17^{\circ}41'$ the same with that of Misteca.

Mr. Wynch at Ganjam in $19^{\circ}30'$ as far north as Pueblo de los Angeles and Tlalcala will I believe be induced to make a plantation.

Colonel Elphinston commanding Chingleput, Mr. Wood at Tanjore, Mr. Skardon at Chinapa-naig Pollam, and several other Gentlemen to the Southward, where the Plant is *indigenous*, acquaint me they are cultivating the *Opuntias* with great care.

Should we fail of success in rearing Cochineal here, the difference of Seasons will probably be the principal cause, and in that case it will only be necessary to transfer the plantations to the same Latitudes on the other side of the Peninsula, where the Rains fall in June the same time they experience the wet Season on *Terra Firma*.

Could we look back to the ancient *Guaxacans* I question if it would appear that they had brought their Cochineal to perfection in so short a space of time as 6 months; nor can we suppose the *Guasfnangoes* learned to reduce the Silver from the ore on the first discovery of it.

I have

I have now two different Insects thriving very well on the *Opuntia*, viz. that of the Guava kind, and the one just mentioned on the *Brinjaul*, but as neither of them have acquired the requisite colour, I have solicited a friend, Mr. Topping, to take a Drawing of the plant described in my letter of the 26. *Ultimo*, which I inclose for your inspection; for although I therein remark an agreement in the colour of the flowers of the *Opuntia* described in Sir Hans Sloanes second Volume of the natural History of Jamaica Table VIII; yet I observe an eminent difference in the structure.

The *Stamina* and *Stigma* of that Plant are drawn much longer than the *Petals*, whereas the *Petals* of the Plants here shut every evening, and are so much longer than the *Stamina* and *Stigma*, as entirely to cover them, which last however seems most consistent with Nature.

The Drawings of Mr. Topping are from Plants I had put into the ground in December last, some of which are near four feet in height, and the Country People tell me they will become ten or twelve feet high, but I cannot find from any of their accounts, that the fruit ever becomes of a red colour, which is discouraging, as the Guava Insect accumulates on the Fruit more than on the Leaves, as well of the Guava, as the Custard Apple, and *Opuntia*; and a History of America published by W. Ruffel Esqr. of Gray's Inn, page 376 *et sequentia*, quotes from *Pere le Bat*, *Reynall* &c. that the fruit is full of Crimion juice, and to that juice the *Cochineal* Insects owe their Colour.

The *Brinjaul* Insect, though incapable of moving from one place to another, after its cylindrical case has adhered to the Plant; yet the Guava Insect in the late dry Season, when the leaves of the Trees were parched, could not be found on the Guava Tree, but after some search was found on the *Solanum Lycopersicon*, a culinary plant here, and on various weeds in their neighbourhood.

As far as I can perceive, the ants are the principal Enemies of these Insects, from whom it may be difficult to preserve them, as the *Phlogistic Aroma* of *Petroleum*, *Liver of Sulphur*, or *Assafetida*, would be hurtful; and the introduction of Fowls into the grounds attended with the inconvenience of devouring both together.

The most eligible method, therefore, of keeping off the ants, is to wash the *Opuntia* grounds with Cow Dung, after the manner of the *Hindoos*; and afterwards to strew quick lime, or wood ashes over it.

Another great inconvenience is the high winds, which not only blow the insects from the leaves, but likewise break down the *Opuntia* Plants, which
are

are very brittle; to remedy which a wall six or seven feet high will be necessary to enclose every plantation, from which no disadvantage need be apprehended, as the *Coccus* insects are always found in shady places.

The rains here can be of little prejudice excepting at the time of the *Monsoon*, when leaves of the plants with Insects upon them may be lopped off and housed.

I have published advertisements in the English and *Tamul* Languages, offering a reward to such Persons, as will collect and cure the *Chloëon* or Grass Egg in sufficient quantity to enable the Artists in Europe farther to ascertain its Virtues, being convinced the active prosecution of this Work will be attended with eminent benefit to a Country, which for three fourths of the Year denies admission to the Plough share, and in which the labours of the Loom become every day less valuable, from the great improvements made in the Manufactures of Europe.

Fort St. George
May 27th 1787,

I am with Esteem,

Dear Sir,

Your very obedient Servant

JAMES ANDERSON.



F I N I S

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1. The first of these is the fact that the system is not a simple one, and that it is not possible to describe it in a simple way. It is a complex system, and it is not possible to describe it in a simple way.

1. The first part of the document is a list of names and titles, including "The Hon. Mr. Justice" and "The Hon. Mr. Justice".

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Mr. Nicholas Green
Munich St. —